DATABASE WEEKEND – Maio 2024

Performance de SQL Server para NÃO DBAs

Ou como não passar vergonha quando o assunto for Performance Tuning…

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vakinha.com.br/4755864

Apoio ao Rio Grande do Sul

.NET SP

AZURE na prática

CODING NIGHT

InterOP

AZURE Talks

Sp_who(dba) – Marcelo Adade

- **Microsoft Data Platform Internal Principal Consultant at Pythian (Ottawa)**
- **Database Consultant and Instructor at DBBITS (Sao Paulo)**
- **Microsoft Data Platform MVP**
- **SQLSATURDAY organizer**
- https://linktr.ee/marceloadade
- https://pythian.com/careers/

Pythian LOVE YOUR DATA

MVP

Agenda

- Performance no SQL SERVER
- Onde estão meus dados?
- Arquitetura do SQL Server
- Paradigmas de programação
- O processo de melhoria
- Executando uma query
- Operadores
- Índices

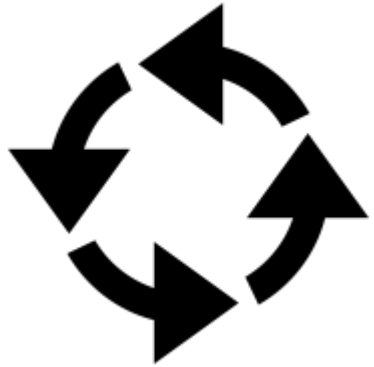
Performance no SQL SERVER

Arquitetura da Aplicação (Solução)

- APP Servers;
- Networking;
- SAN;
- SAN Infra;
- DB Servers;
- Citrix
- Camadas lógicas e físicas

O processo de melhoria

Processo iterativo e constante:

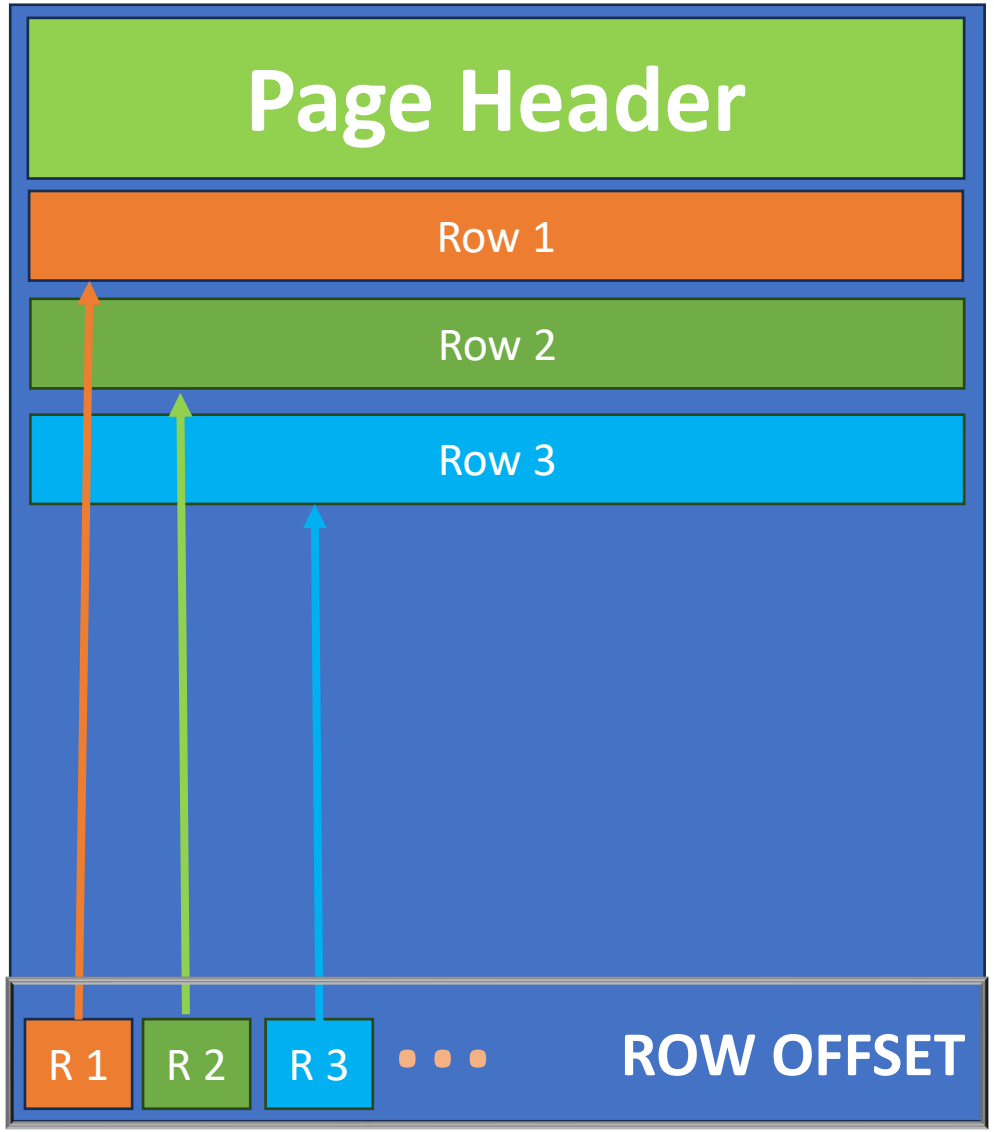


1. Identificar gargalos e problemas;
2. Resolver os principais problemas;
3. Medir o desempenho;
4. Voltar ao primeiro passo caso o resultado não seja satisfatório.

Humor: https://fernandofranzini.wordpress.com/2012/07/11/pog-programacao-orientada-a-gambiarras/

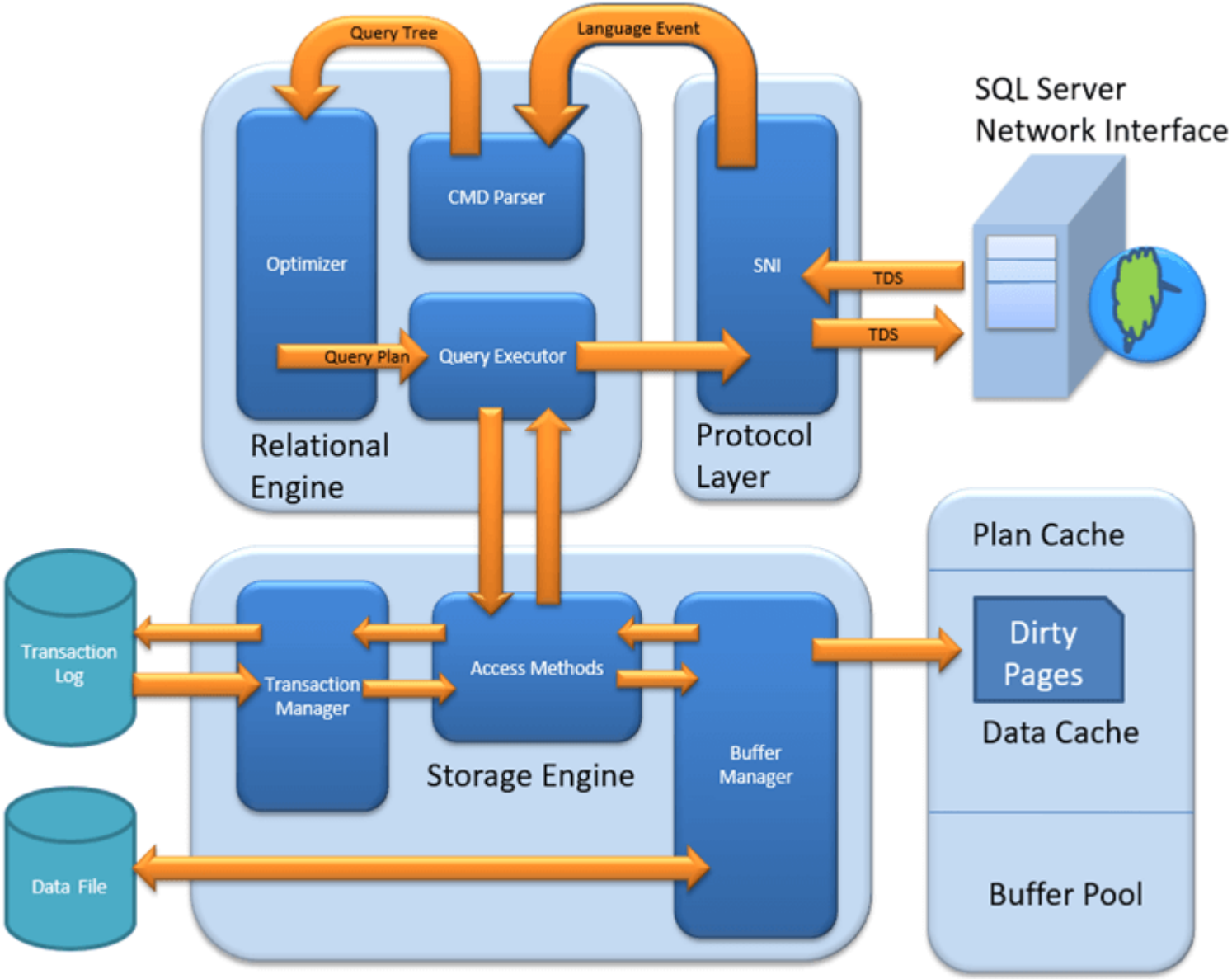
Onde estão meus dados?

Página de dados – onde tudo está armazenado

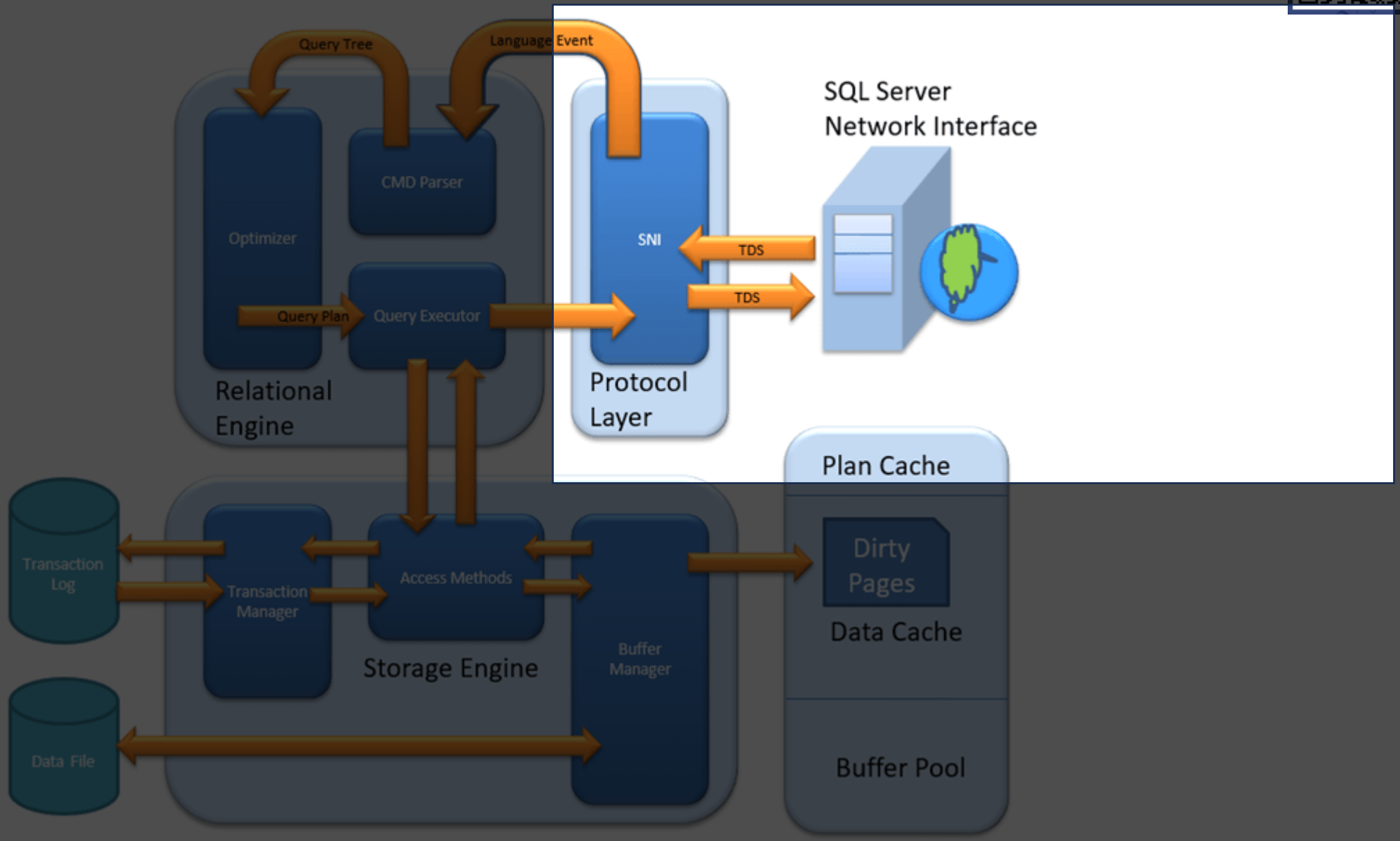


8 KB

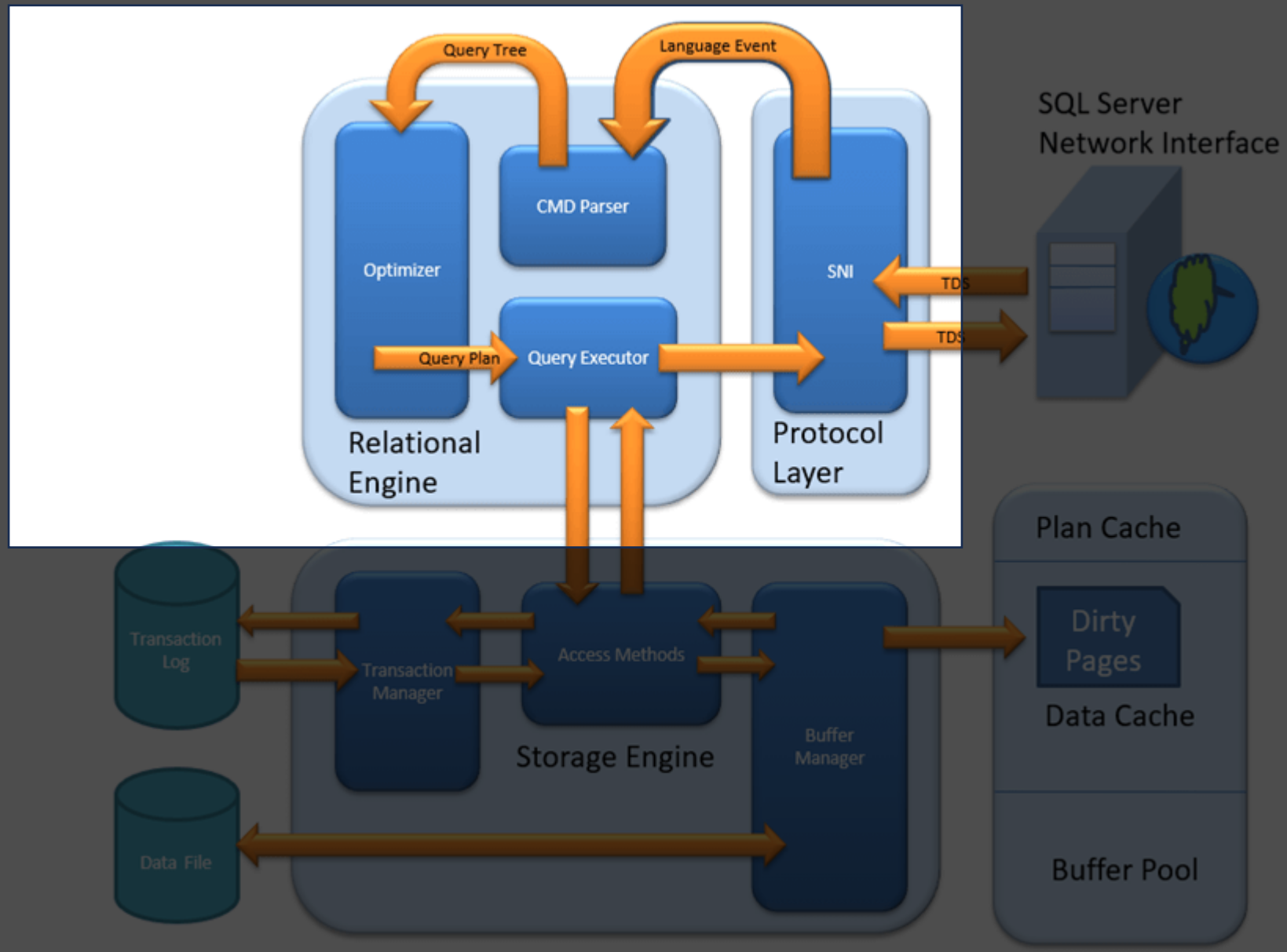
Arquitetura do SQL SERVER



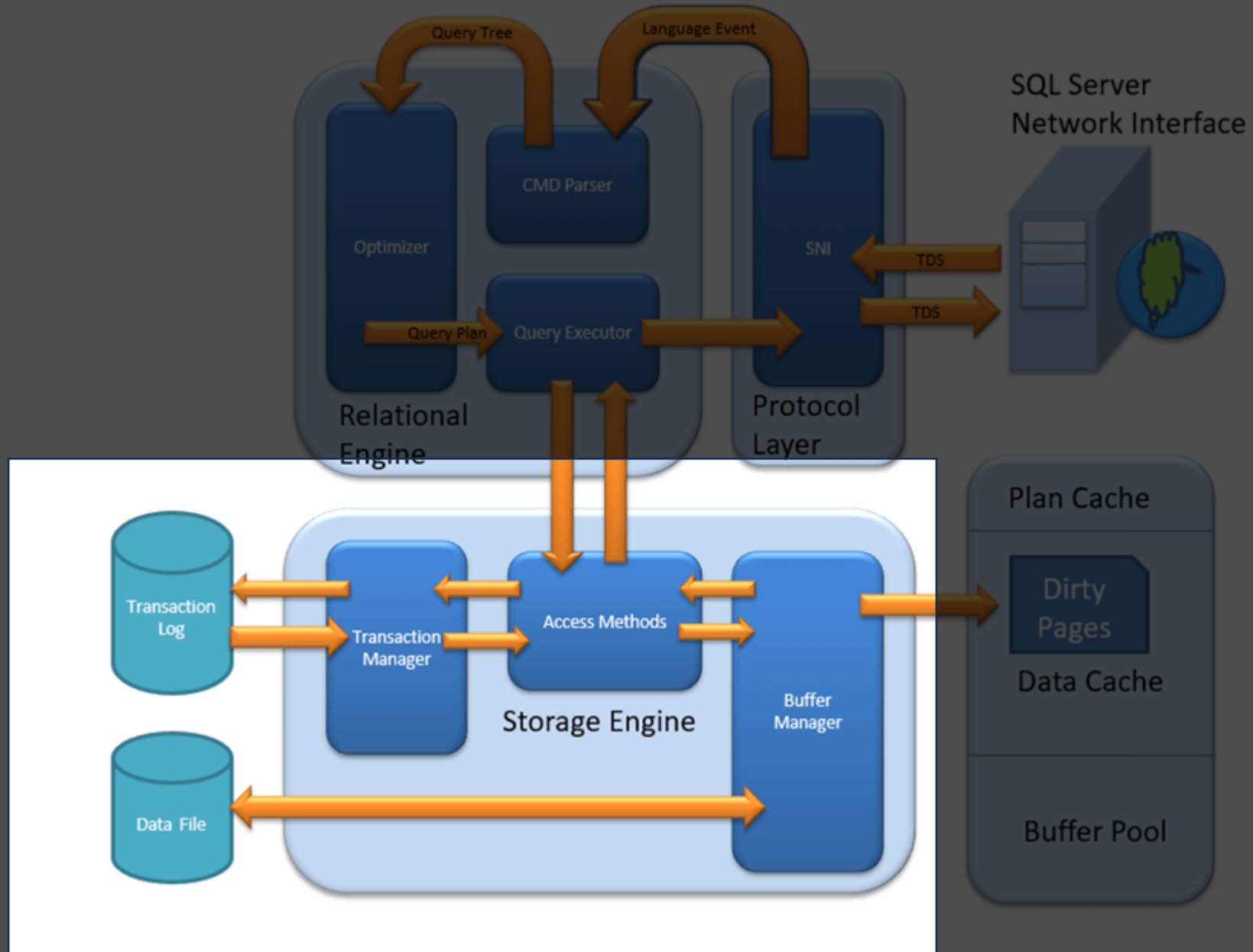
Arquitetura do SQL SERVER



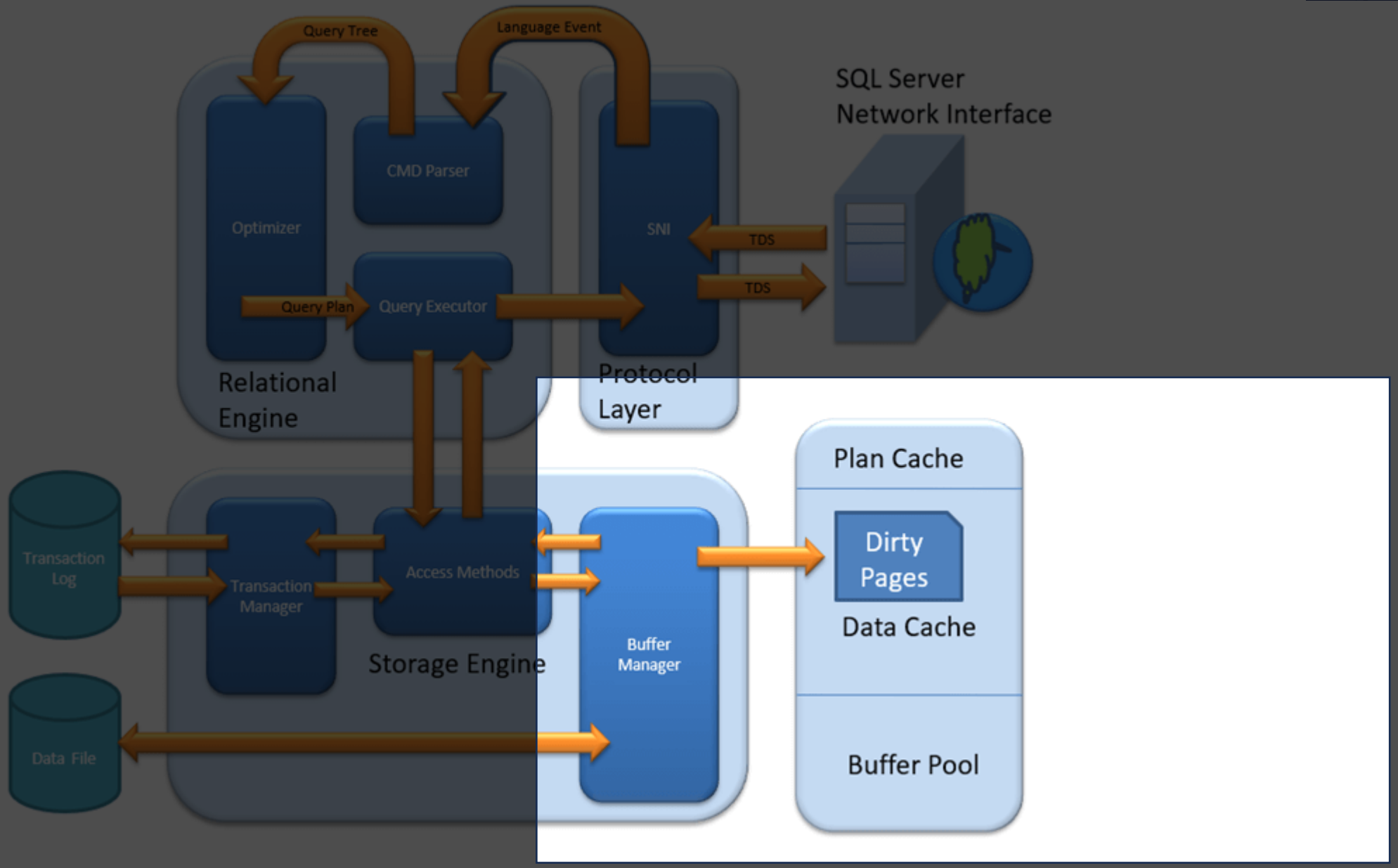
Arquitetura do SQL SERVER



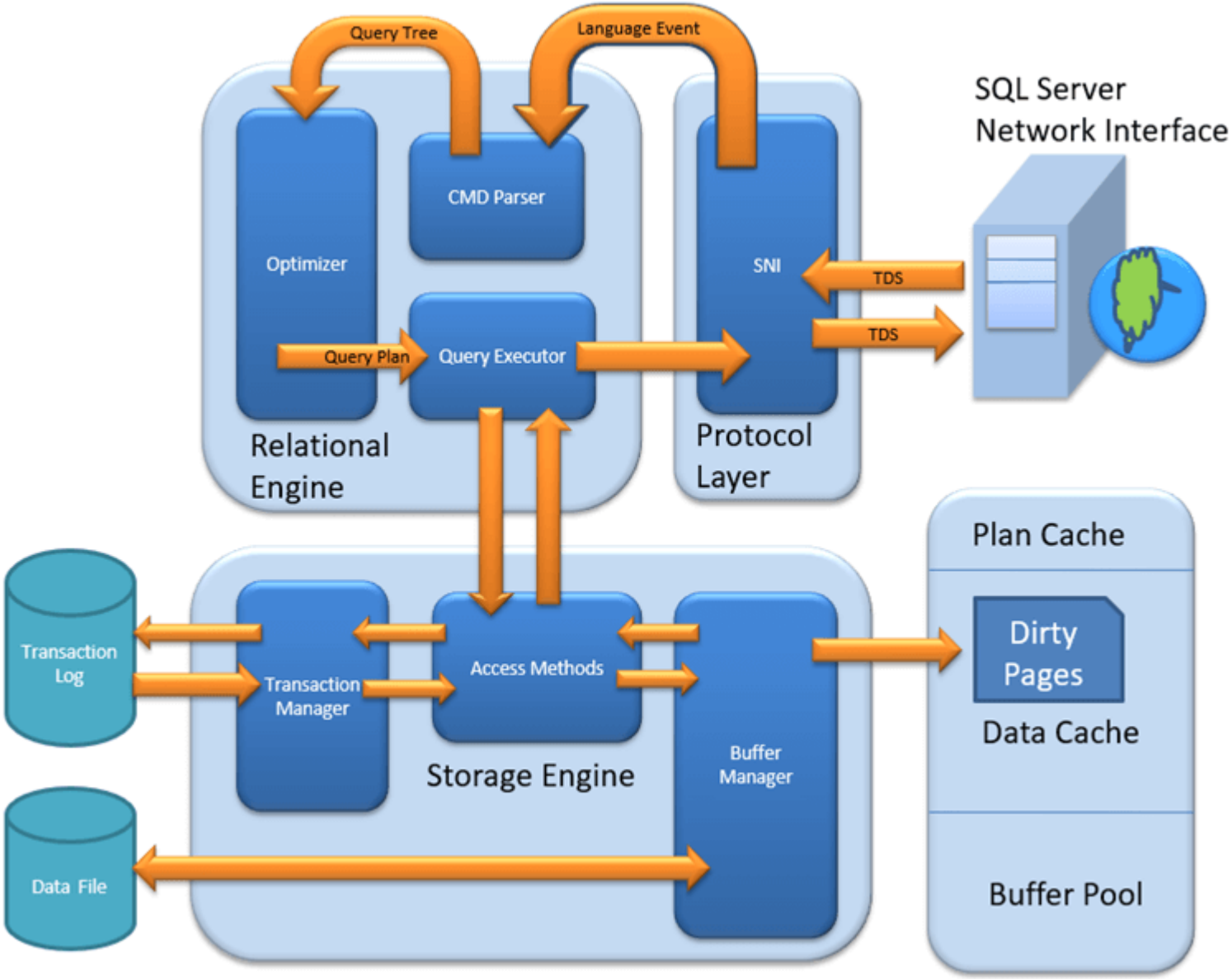
Arquitetura do SQL SERVER



Arquitetura do SQL SERVER



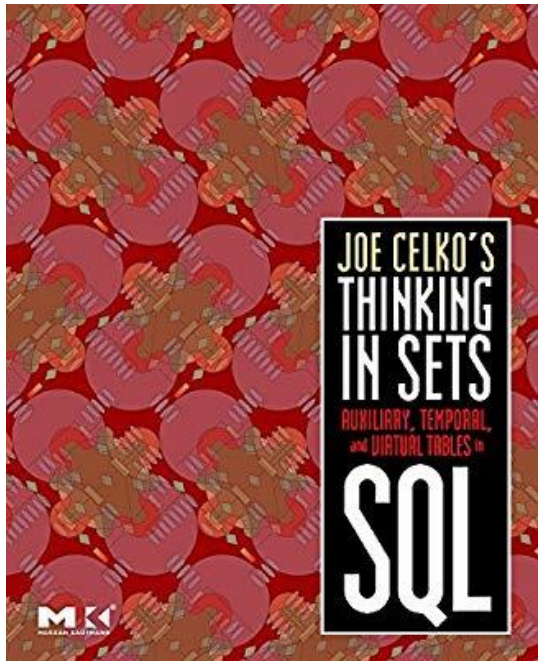
Arquitetura do SQL SERVER



Paradigmas...

Set based X Procedural based

- Mindset procedural (passo a passo para chegar no resultado)
- Mindset declarativo (pensar na exibição do resultado)

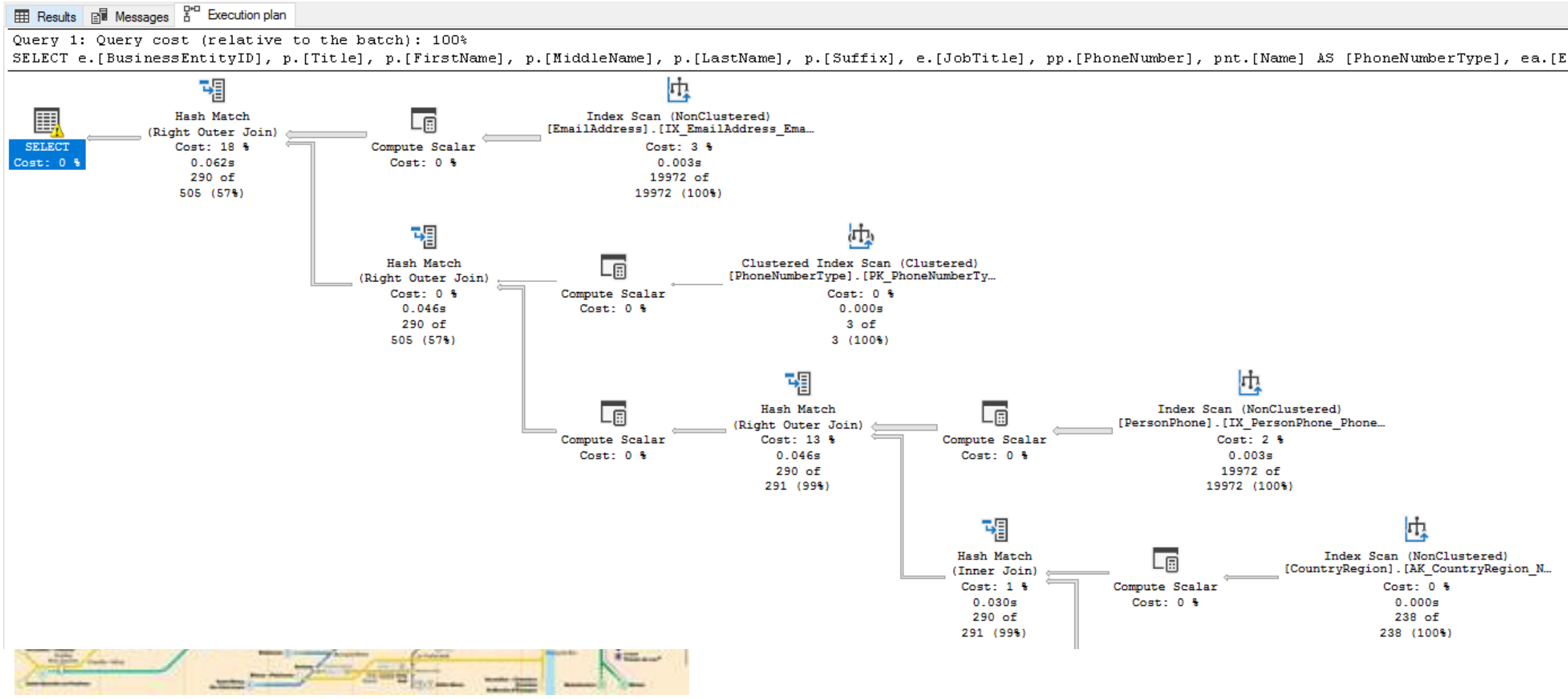


Executando uma query (*under the hood*)

1. Simplification
2. Trivial Plan
3. Auto Create/Update Stats
4. Search 0
5. Search 1
6. Search 2
7. Good (e) plan

Como o SQL SERVER estima o melhor plano?

Planos de Execução



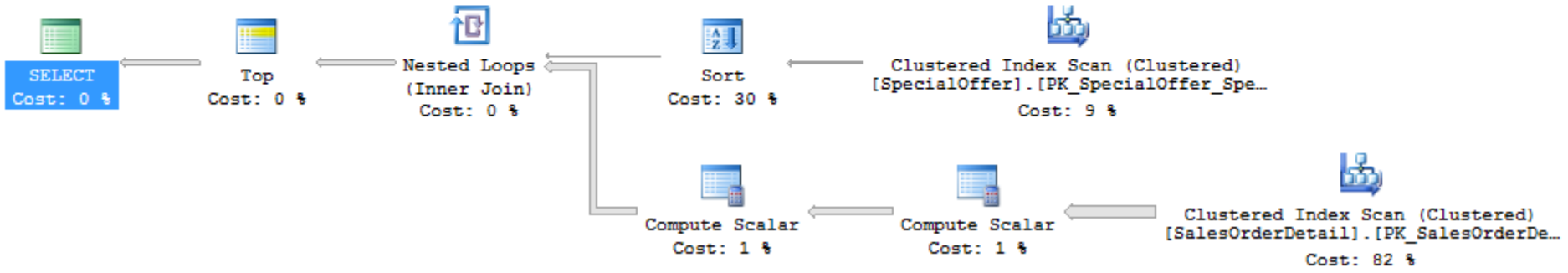
Operadores

```
Select TOP 200 * From
Sales.SalesOrderDetail OD
  Inner join Sales.SpecialOffer SO on OD.SpecialOfferID = SO.SpecialOfferID
  Order by MaxQTY DESC
```

100 %

Results | Messages | Execution plan

```
Query 1: Query cost (relative to the batch): 100%
Select TOP 200 * From Sales.SalesOrderDetail OD Inner join Sales.SpecialOffer SO on OD.SpecialOfferID = SO.SpecialOf
```



- …

Índices

—Index—

–A–

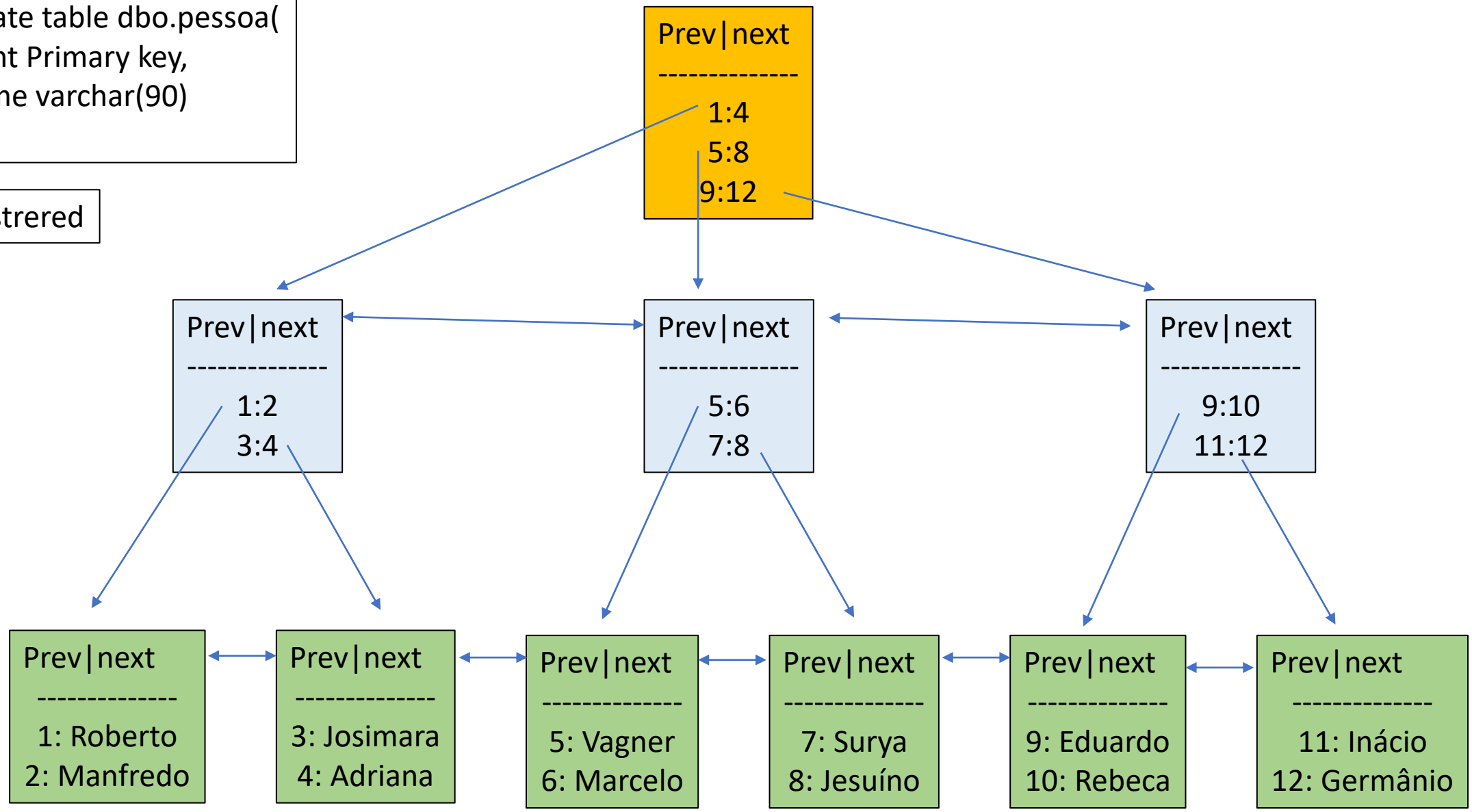
–B–

mais rápido ao dado

ing mas não é onde

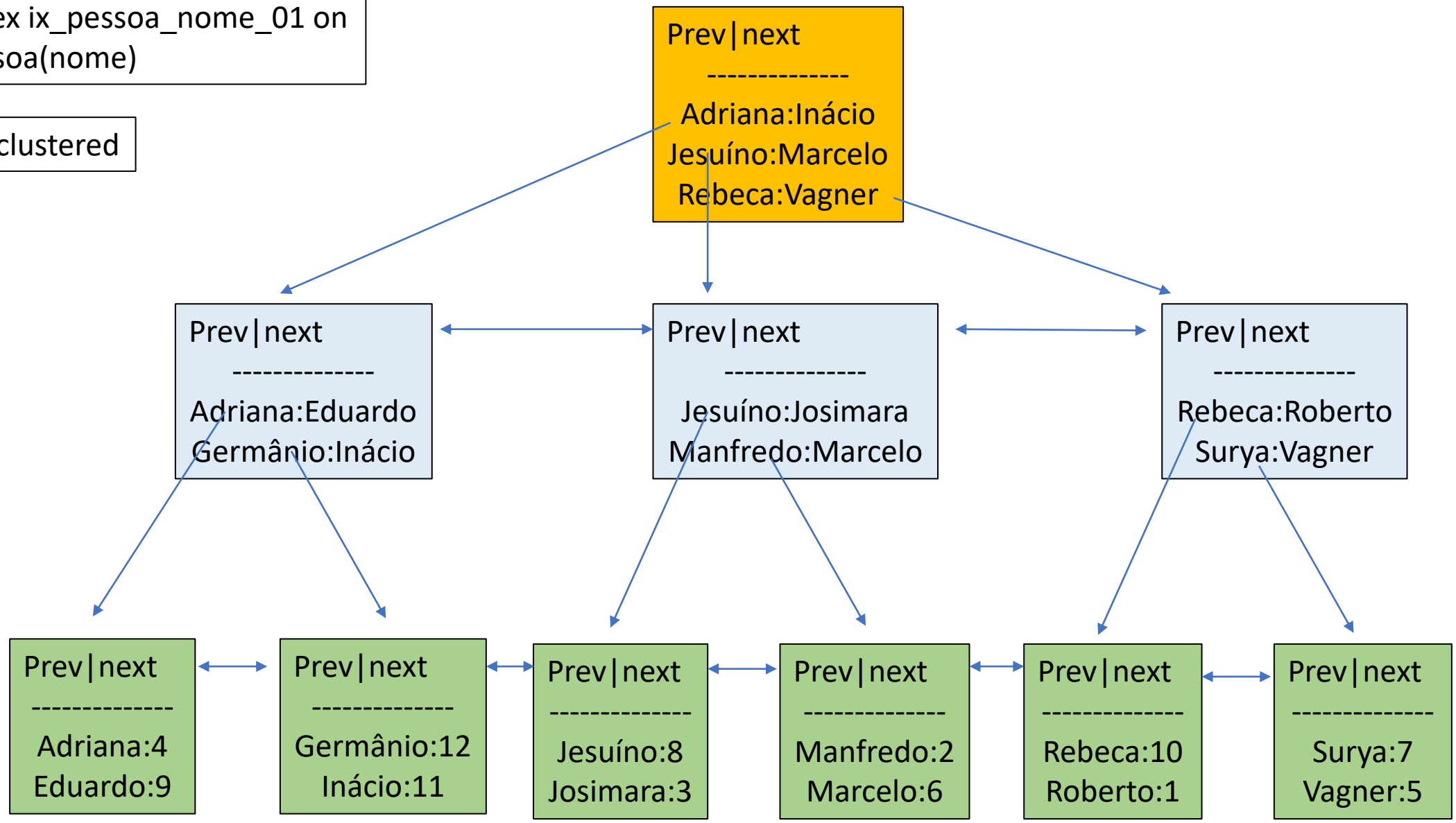
```
Create table dbo.pessoa(
ID int Primary key,
Nome varchar(90)
);
```

Clustrered



Index ix_pessoa_nome_01 on Pessoa(nome)

Nonclustered



Configurações da Instância

- Optimize for Ad-Hoc queries
- Max (/Min) Server Memory
- Configurações nos bds também!

Configurações da Instância

Server memory options

Minimum server memory (in MB):

0

Maximum server memory (in MB):

2147483647

Other memory options

Index creation memory (in KB, 0 = dynamic memory):

0

Minimum memory per query (in KB):

1024

Configured values

Running values

Server memory options

Minimum server memory (in MB):

1024

Maximum server memory (in MB):

4096

Other memory options

Index creation memory (in KB, 0 = dynamic memory):

0

Minimum memory per query (in KB):

1024

Running values

Configurações da Instância

Containment	
Enable Contained Databases	**False**
FILESTREAM	
FILESTREAM Access Level	**Disabled**
FILESTREAM Share Name	SQL2017
Miscellaneous	
Allow Triggers to Fire Others	**True**
Blocked Process Threshold	**0**
Boost SQL Server Priority	**False**
Cursor Threshold	**-1**
Default Full-Text Language	**1033**
Default Language	**English**
Full-Text Upgrade Option	**Import**
Max Text Replication Size	**65536**
Optimize for Ad hoc Workloads	**False**
Scan for Startup Procs	**False**
Two Digit Year Cutoff	**2049**
Use Windows fibers (lightweight pooling)	**False**
Network	
Network Packet Size	**4096**
Remote Login Timeout	**10**
Parallelism	
Cost Threshold for Parallelism	**5**
Locks	**0**
Max Degree of Parallelism	**0**
Query Wait	**-1**

Cost Threshold for Parallelism
Specify the threshold where Microsoft SQL Server creates and executes parallel plans.

◉ Configured values ○ Running values

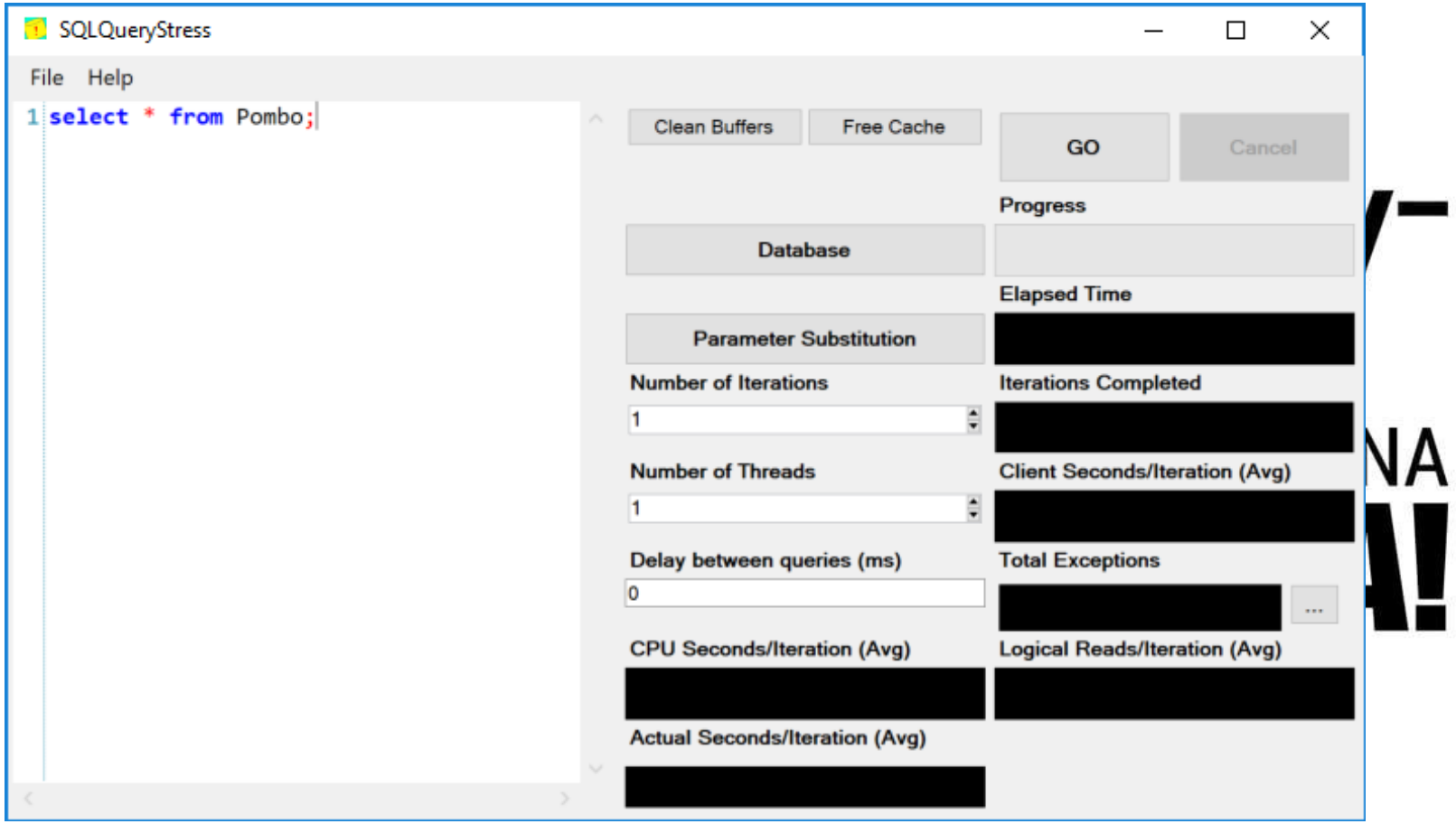
Containment	
Enable Contained Databases	**False**
FILESTREAM	
FILESTREAM Access Level	**Disabled**
FILESTREAM Share Name	SQL2017
Miscellaneous	
Allow Triggers to Fire Others	**True**
Blocked Process Threshold	**0**
Boost SQL Server Priority	**False**
Cursor Threshold	**-1**
Default Full-Text Language	**1033**
Default Language	**English**
Full-Text Upgrade Option	**Import**
Max Text Replication Size	**65536**
Optimize for Ad hoc Workloads	**True**
Scan for Startup Procs	**False**
Two Digit Year Cutoff	**2049**
Use Windows fibers (lightweight pooling)	**False**
Network	
Network Packet Size	**4096**
Remote Login Timeout	**10**
Parallelism	
Cost Threshold for Parallelism	**50**
Locks	**0**
Max Degree of Parallelism	**2**
Query Wait	**-1**

Optimize for Ad hoc Workloads
When this option is set, plan cache size is further reduced for single-use adhoc OLTP workload.

○ Running values

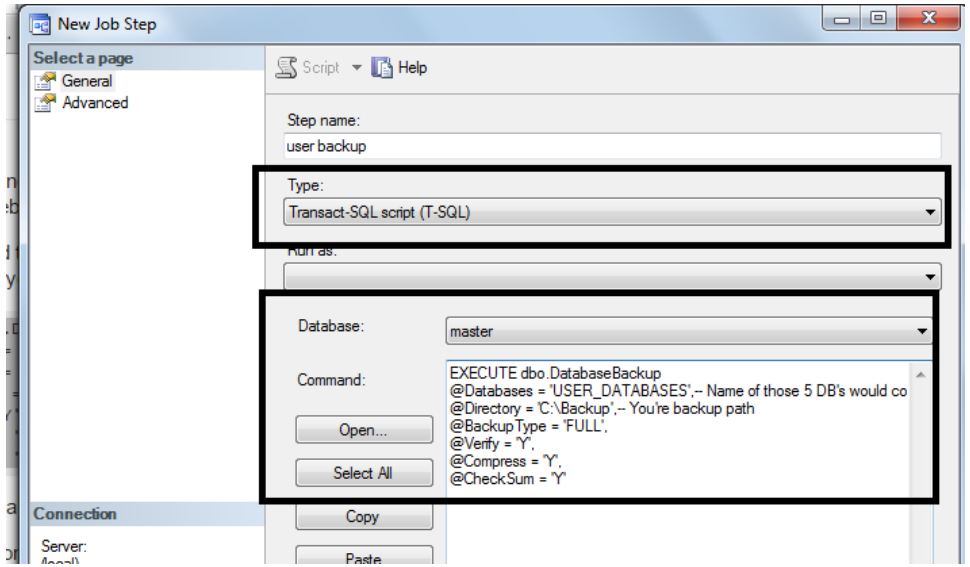
Porque na minha máquina roda bem?

- Workload real X Ambiente de testes



Manutenção

- Estatísticas precisam ser atualizadas;
- Índices precisam ser desfragmentados;
- As bases de dados precisam ter suas estruturas íntegras.



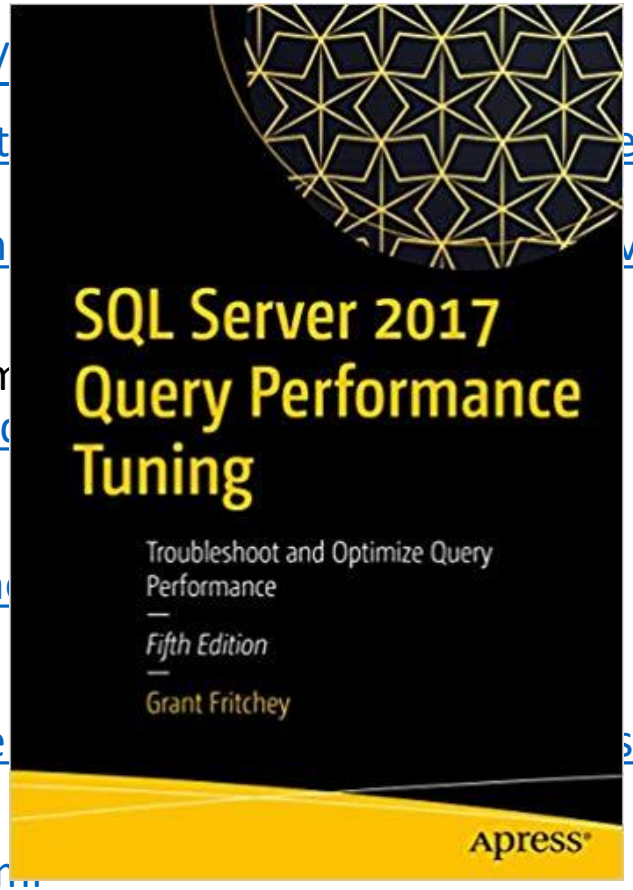
https://ola.hallengren.com/

Take away

- Entenda o funcionamento dos índices!
- Qual o percentual de participação do SQL SERVER na solução toda?
- Analise o plano de execução!
- Bancos de dados precisam de manutenção!
- Performance tuning é um trabalho contínuo!
- Problemas típicos de performance no SQL Server: Indexação, modelo de dados, bloqueios excessivos, estatísticas desatualizadas, operações procedurais.

Referências

- Curso: Performance Tuning wit
- Complete Show plan operators
- SQL Server 2017 Query Perfor
- Query stress: https://github.co
- https://aboutsqlserver.com/20
- https://sqlwizard.blog/2018/0
- https://docs.microsoft.com/en
- https://blog.devart.com/sql-server-index-fragmentation-in-depth.html
- https://www.guru99.com/sql-server-architecture.html



Thank you and keep in touch!